Serious Ocarina Player

The Fundamentals of Excellent Performance

Robert Hickman

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A few commercial products are mentioned in the book. These are not endorsements and the author receives no financial return for their inclusion. They are simply things used by the author, which happen to work well.

If you have any queries, the author may be contacted at info@pureocarinas.com.

Acknowledgements

Much of the content of this book is based on direct study of ocarinas in person, including measurements of playing characteristics, observations of how different designs relate to the hands, and experiences of playing the instrument, especially those playing with other musicians. Yet it is by no means a one-man effort.

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The content of this book was written in public in order to get feedback for improvements or missing details. Such input came from many people to who I am very grateful. Unfortunately, this was written over such a long time, and input came from so many people that I can't remember everyone to credit them individually, and it would be a very large list if I could.

This book uses two diagrams showing diaphragmatic breathing which were sourced from Wikipedia. The author John Pierce released them into the public domain, but I wish to give credit anyway.

To Kristina: writing this book was a massive effort spanning multiple years, with a big final push to make a pre-release for the 2019 Budrio ocarina festival. It drove me to my limit, and following the festival, my energy was spent. I crashed hard from burnout and anxiety. But little did I know that I'd also met someone at the festival who would drag me out of this rut. In your words, 'I don't get used to smiling so much.'

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Why I wrote this book

Like many people do, I approached the ocarina under the impression that it is a simple instrument, one where technique is not required. It looks easy enough I thought. However, the more time I spent playing, the more I realised that this instrument is vastly more complex than intuition suggests. The approaches which were intuitive were almost always bad. I made many mistakes, such as playing wildly out of tune, making poor use of articulations, and moving my fingers excessively. Over time I began looking into the practice techniques of many other instruments and started adapting these to the ocarina.

Yet even with this improved approach it was still clear that I did not understand the instrument I was learning to play. I frequently played in public and doing this resulted in random problems, and often in embarrassing situations. To give one example, I was practising with an Irish music group, and the practice space we had was very cold. When we subsequently performed, we were in a warmer environment and I was out of tune. I didn't know how ocarinas are affected by temperature, thus I had not practised for this eventuality. The music was too fast to compensate dynamically. From this point I sought to understand the instrument.

I wrote this book to document what I have learned—to lay down a baseline of technical understanding and technique which must be known to play the ocarina to a high standard. Hopefully it will save you from the arduous process of learning how to learn the instrument, before learning to play it. Unfortunately, many of the mistakes which are easy to make on the ocarina only become apparent through training, or prior experience. Without guidance, there is a risk of being forever stuck playing at a trivial level, or wasting a large amount of time practising with an approach not conducive to playing well.

To be clear, this book is focused on the Italian ocarina—ocarina di Budrio—and direct descendants of it like transverse multichambers. In practice the term 'ocarina' is often used as a catch all for anything based on a hollow chamber, what can otherwise be called a vessel flute. It may refer to a wide range of things that have little or no historical connection, some of which are not viable as serious instruments. I have no objection to these in principle, although it would be a lot less confusing if different names were used.

Who is this book for?

Musicians interested in learning the ocarina

If you're someone who has some experience with music, and perhaps play another instrument, this book will show you the fundamentals of playing the ocarina. Do note that while ocarinas have a similar fingering to many wind instruments, they do not behave like a tubular instrument. Also, as their range is so limited, ocarinas require a view of music which isn't common on most instruments. You will find details of these issues within.

Ocarina players looking to improve their skill

Unfortunately it is relatively common to approach playing the ocarina haphazardly. This often leads to poor technique or approach and can hold you back. This book will give you a general understanding of the instrument and help you identify and correct any mistakes you may be making. A basic understanding of music theory is assumed. So if you skipped theory—for instance, if you learned using ocarina tabs—the part 'Approaching basic theory(170)' covers the basics.

Complete beginners to music

The task of learning an instrument as a beginner actually involves two separate issues: learning the technicalities of how an instrument works, and developing an awareness of the 'language' of music in a broader sense. This book focuses almost exclusively on the first topic. Reading this book will give you a good appreciation for the ocarina at a technical level, but to get started playing music you'll want to reference other sources.

There are other resources which introduce the ocarina from a beginners perspective, which can be found by searching the web. The part 'Approaching basic theory(170)' introduces the essentials of theory you'll need to understand this book.

Also be aware that ocarinas do have some downsides as a first instrument which aren't that widely known. See 'Cons of the ocarina as a first instrument(217)'.

People writing music for the ocarina

After reading this book, you'll have a detailed technical understanding of the instrument and what it can do. The section 'Composing for the ocarina(239)' is a good place to begin.

How to read this book

This book is split into a number of parts as follows:

Part 1 covers the ocarina as an instrument, how to identify playable ocarinas, the fingering systems, and playing characteristics.

Part 2 covers the fundamental techniques of playing the ocarina to a high standard—things like learning the fingerings, blowing correctly and playing in tune.

Part 3 covers multichambers. Many of the techniques used to play them are the same as single chambers, and this section covers details unique to them.

Part 4 expands on parts 2 and 3. The ocarina's technical constraints like range demand a number of skills which are not common practice on most instruments, including things like creating emphasis with ornamentation, modifying music into a smaller range, and dealing with ocarinas in different keys.

Part 5 introduces the basics of theory. It is meant to give you enough background to understand this book if you've skipped theory such as if you learned by ear or using ocarina tabs.

Part 6 covers a number of frequently asked questions.

Finally, part 7 is a collection of appendices covering a range of topics including studio recording the ocarina, some common mistakes that people make, and an overview of the instrument for composers. Also included are two essays covering the challenges of marketing the ocarina and some thoughts on teaching music to children. The latter point arose as I only came to understand the subject as an adult. It explores my observations on why that happened and how it could have been avoided.

While you can read these in order, start to finish, you don't have to. The different sections are largely independent, and content is cross referenced with page numbers in parentheses. While teaching materials are often organised in an idealised sequence, in reality, learning often doesn't happen like that. It is naturally approached more randomly, through which a question or sticking point arises.

This book supports this learning style as it is written in short sections that cover a single topic. You can use the table of contents to look for relevant pages and go directly to them. From there, page references can be followed to additional detail, and some critical points are intentionally duplicated to ease out of order reading. If you've ever surfed a wiki, you'll know this pattern.

Be aware that some topics are circularly dependent, such that they must be learned together. I have reduced these as much as possible and a substantial part of the effort in writing this book was actually in content ordering. Although, you should not be concerned if you don't understand something right away.

This book was originally a website, and some sections featured audio, video, or interactive demonstrations. As this content cannot be reproduced in print, I have instead included static images which attempt to communicate the same point. Links to the original content are also provided.

About the ocarina

What is an ocarina?

The ocarina is a wind instrument most notable for its pure ethereal tone. Quality transverse ocarinas are capable of creating everything from beautiful, mournful, slow melodies to highly ornamented, upbeat tunes. They have a straightforward linear fingering system(35) similar to a flute or tin whistle, and are fully chromatic. Most ocarinas are small, easily slipped into a pocket or bag, and played wherever it takes your fancy.

The modern ocarina was created by Giuseppe Donati in 19th century Budrio, northern Italy. At the time, the only available vessel flutes were crude toys capable of playing just a few notes. Donati developed an instrument and fingering system capable of playing chromatically over an octave and a fourth. The word 'ocarina' comes from a historic dialect of Italian, and means 'little goose'. It originally referred to sculptural ceramic whistles shaped like a goose, and Donati adopted the name for his instrument.

Donati's instrument was shaped like a cone, with a protruding mouthpiece and 10 finger holes. Modern instruments generally retain this same design, but have evolved in a number of ways. Most notably, 'subholes(15)' were added by Asian makers, which extend the sounding range of the instrument downwards. Ocarinas often have one or two subholes; the one shown below is an 11 hole ocarina.

Unlike most wind instruments, ocarinas cannot be overblown to create higher octaves. Each diatonic note has its own hole, and chromatic notes are created using cross-fingering(35), covering the existing holes in a different order. To add additional range, multichambers(48) were created. These retain Donati's basic fingering system, adding additional chambers tuned to play as a single instrument. They extend the sounding range to two octaves or more while maintaining the characteristic pure tone.

Multichambers also provide additional benefits beyond range. As every note has its own hole, single chambers require two thumb holes to maximise their range, and the right thumb hole is also the primary support point. While there are methods of handing this(81), it is a technical challenge. Multichambers eliminate this issue as each chamber is tuned to a different part of the total range, and only one is fingered and blown at a time. Consequently, the right thumb hole can be eliminated, allowing the thumb to exclusively support the instrument.

Ocarinas have only a small repertoire of their own, so music for them is often adapted from other sources. Many people adapt song melodies to the ocarina, and their loud and piercing tone is ideal for playing many kinds of folk music, such as traditional French music and Highland pipe tunes.

The ocarina is an instrument that rewards a creative approach, and you will find that they are capable of some pretty impressive music if you are willing to put in the effort.

What are ocarinas capable of?

To understand the ocarina's capability, it is important to take the right point of view: the ocarina is a limited instrument which works brilliantly in some situations. Limited does not mean useless, and no instrument is inherently 'better' than any other. Music is a collage of sound, and which instruments are best depends on the desired musical effect. Interest in music comes from the interplay of multiple instruments, rarely any single instrument in isolation.

All instruments have their strengths and weaknesses, and much of the skill involved in creating a musical performance is knowing the situations where a given instrument can hold its own. In my experience, ocarinas are most effective as a solo instrument with limited simple accompaniment. The pure tone always rises to the top of a mix and easily cuts through a raucous crowd. I've found them very effective at getting people's attention and have silenced the audience at many open mics with the ocarina.

As noted in the previous section, ocarinas can be used to play quite a wide range of music from lyrical vocal melodies to more upbeat music like Scottish dance tunes. They are functionally similar to the tin whistle, Uilleann pipe, and cornemuse du Centre. Single chambered ocarinas have a range of about an octave and a fourth, with multichambers breaking two octaves. They respond very quickly to both pressure changes and finger movements.

As their pitch changes with blowing pressure, ocarinas only sound in tune at one pressure for a given fingering. Creating emphasis and phrasing thus depends on varied articulation and ornamentation. There is a natural volume dynamic whereby the high notes are considerably louder than the low. Varying from this is technically possible but requires notable player skill to achieve reliably; how to do so is covered later.

Regarding articulation(135) and ornamentation: like all wind instruments, notes can be articulated using the tongue and by slurring multiple notes in a continuous breath. Ocarinas can also create articulation using cuts and strikes, pitched articulations commonly used in Celtic folk music. They work by sounding a higher or lower pitch for such a short duration that it is perceived as an atonal blip or click. They are placed exactly on the sub-beat and can be used interchangeably with tonguing.

Possible ornamentation includes breath and finger slides, vibrato, trills, turns, mordants, and grace notes(142) under limited circumstances. Ornamentation can also be created using cuts and strikes, including rolls, cranns, and strike cranns(147)—essentially an ornamental articulation of multiple sequential notes. While it's a challenge for new players to control, the unstable pitch is also an effective expressive tool. Rhythmic, subtle de-tunings may be used to imply an underlying beat, and the intonation of notes in itself can be used expressively, blue notes being a practical example.

Ocarinas are also capable of varying their tone colour to a limited extent—for example, by humming while playing. Varying the posture of the mouth and the angle at which the instrument is blown affects how airy the sound is, and varying the pressure at the start of a note varies the sound of its attack. If a note is tongued beginning with a lot of pressure, it will begin with a brief squeak. This is easiest to do on the high notes. There is additional freedom if multiple ocarinas are used, as timbre can vary from extremely pure to noticeably 'buzzy'.

While true volume dynamics are technically difficult, they can be implied in a number of ways. One way to do so is to play a pitch slide into the note using the breath. This causes both the pitch and volume to ramp up, and as long as the note starts or finishes in tune, the result sounds fine. As the note's volume changes over its duration, it is perceived as quieter than it actually is. A similar effect can be created by varying note duration: short stacatto notes, for example, create an impression of lower volume.

Ocarinas work best when paired with limited and simple accompaniment like acoustic guitar, ukulele, harp, and piano. The instrument's tone is close to but not exactly a pure sine wave: they have other tonal components including some quiet overtones and a portion of wind noise. These things are required to make the instrument listenable. However, it's very easy to drown them out with overpowering accompaniment, leaving you with an unpleasant sound as a result.

I feel that the ocarina is best used as a 'seasoning' among other instruments. Their pure sound is enjoyable in short bursts but can become fatiguing over long periods of time.

Difficult techniques

There are a number of things that the ocarina technically can do that require considerable player skill to pull off. True volume dynamics are one of these. The ocarina's pitch depends on the total area of open holes, and blowing pressure changes both volume and pitch simultaneously. Consequently, volume dynamics can be attained by partially covering or venting a hole and changing one's pressure so the note sounds in tune at a higher or lower volume. Extending from this, it would be theoretically possible to combine a descending finger slide with an ascending breath slide. If synchronised, they would cancel, resulting in the volume raising while the pitch stays almost constant.

Microtones beyond the 12 tone scale are also possible. The ocarina's pitch is highly unstable and most notes can be bent multiple semitones sharp or flat. Consequently, doing this is really just a matter of using the right breath pressure to sound at the desired pitch, and would require a very good ear to control. It is possible to simplify this using alternative fingerings(35) in some circumstances, and it can be combined with partially venting holes to create volume dynamics.

Playing multiple ocarinas in unison is possible but is also difficult to do. If multiple ocarinas sound the same note simultaneously but are out of tune, an audible beating results. When the pitches are close, this can add a pleasant depth to the sound. Large errors, however, sound obnoxious. Pulling this off requires a very tight connection between the players; it is easiest with two people and only gets harder from there. With more players, it becomes increasingly difficult for any single individual to even hear when they are in tune without reference from an instrument with a different timbre.

When playing in a group, it is more common to have an ensemble of players (normally 7) playing ocarinas in different keys and octaves. This tradition goes back to the early origin of the instrument in Budrio. The octave separation makes slight errors far less obvious.

Things that ocarinas aren't good at

Like all instruments, there are a number of things that ocarinas are naturally poor at. The same characteristics that make the instrument effective at lead melody make it function poorly as an accompanying instrument. They always tend to rise to the top of the mix and stand out too much, stealing focus from the lead. That being said, lower pitched ocarinas can be effective for infill and interludes.

As noted previously, ocarinas have an innate volume dynamic leaving the high notes much louder. Consequently, they work well in some pieces of music, and terribly if the situation calls for a loud low note. Even if a player is good enough to control volume dynamics, the range of control is quite limited. The highest notes will always be louder than the lowest notes, as they have a minimum pressure to create a clean tone, and the low notes can only be pushed so much before they sound too harsh.

Music which makes extensive use of leaps, particularly repeated sequential leaps to a single note, frequently sounds unbalanced as the high note will stand out far more. It is also technically difficult to reliably keep the low note in tune. There is a considerable pressure difference between high and low notes, and the pitches of low notes are much less stable.

Lastly, ocarinas have a limited sounding range(29), meaning that there is a lot of music they cannot play. Multichambers(48) do a lot to address this, but their range is still limited; it may still only be possible to play something in a single key, even with the extended range that multichambers provide. People often seem to get tripped up by this, assuming the instrument is as flexible as others, such as concert flute, when it isn't. Music selection is very important. There is no guarantee that anything you may want to play will actually fit on the instrument unmodified.

Closing

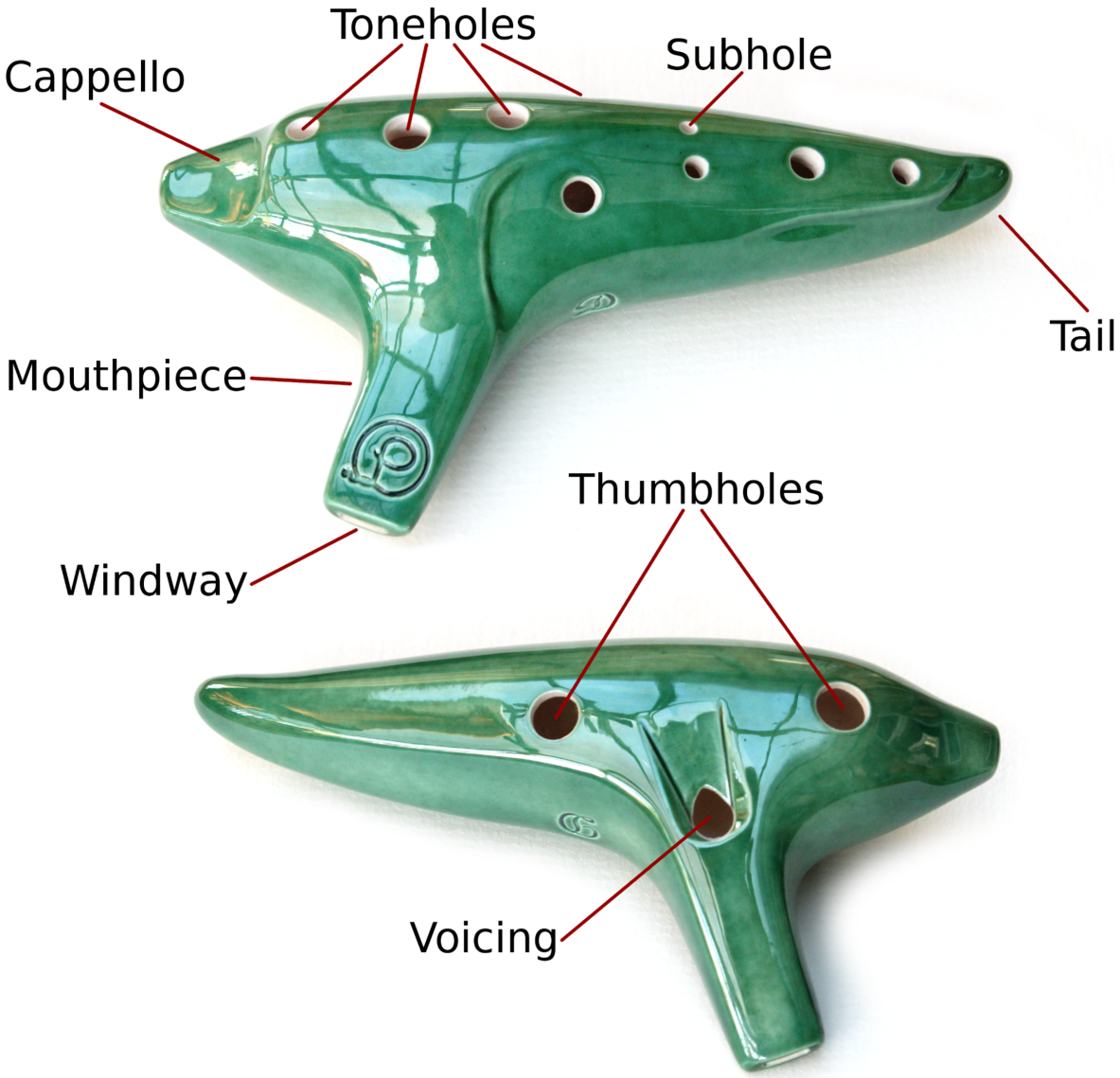
People often consider instruments as having built-in capabilities. For example, the recorder is often dismissed as a child's instrument, whereas the violin and piano are considered 'real' instruments to which skilled musicians will aspire. If you actually take the time to examine this assumption, however, you will see that it is flawed. The recorder, violin, and piano are all inanimate objects. All they can do by themselves is gather dust. They are transformed into capable instruments by the skill of their players.

Because of how they are viewed in culture, violins and pianos have numerous virtuoso players, people who have put in the effort to push the instruments to their limits and create truly moving performances. As people often look down on the recorder, few discover its full potential but, if you look into it, you'll discover that recorder virtuosos do exist. They produce truly excellent music with their seemingly simple and limited instruments.

Visually simple instruments often hide their potential underneath their appearances, and the ocarina is no exception. If you explore its potential, you'll find that the ocarina more capable than you think. To draw a comparison, even the humble Jew's harp is capable of producing interesting music ranging from complicated rhythms to deep trances and polyphonic melodies, much more than the simple 'twang' and 'boing' sounds that many people know it for.

The parts of an ocarina

While ocarinas are usually formed from a single piece of ceramic, different parts of the instrument are given different names. These are labelled in the diagram below. Note that while a single chambered ocarina is shown, multichambers(48) feature the same components; they just have multiple of each.



Body

An ocarina's body forms a hollow chamber which is used to produce sound. It also features multiple resting points for fingers, the tail and cappello noted below.

Mouthpiece / windway

The mouthpiece includes the windway where the player blows. It is often slightly angled for ergonomic reasons.

Voicing

The air exiting the windway crosses the sound hole and strikes the labium. This causes the air in the chamber to oscillate and produce sound. The voicing is never covered while playing.

Toneholes / subhole

The ocarina's toneholes are used to play different notes, and are covered by the fingers. Ocarinas have 10 primary holes, 8 on top plus 2 thumb holes. In addition to these, ocarinas can feature one or two subholes, additional holes placed beside another hole. These are used to play lower notes(29) and are played by sliding a finger forwards(35), covering two holes with the pad of the finger. The ocarina shown here is an 11 hole with one subhole above the right hand ring finger. This can used to play a semitone below the tonic. Not all ocarinas have a subhole.

Tail

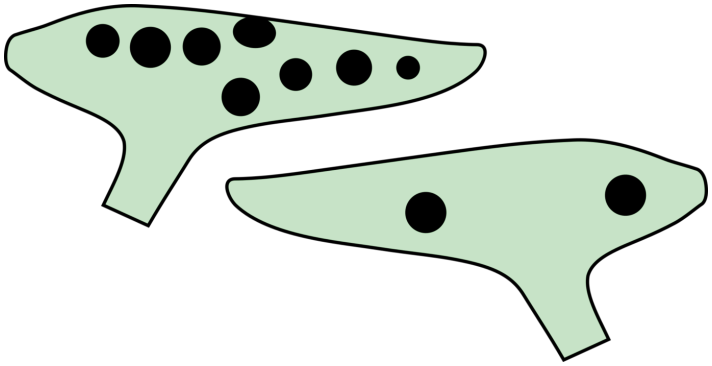
When not covering its tonehole, the right pinky finger rests on the ocarina's tail beside the hole. This support point is vital to stabilizing the ocarina on the high notes(69).

Cappello

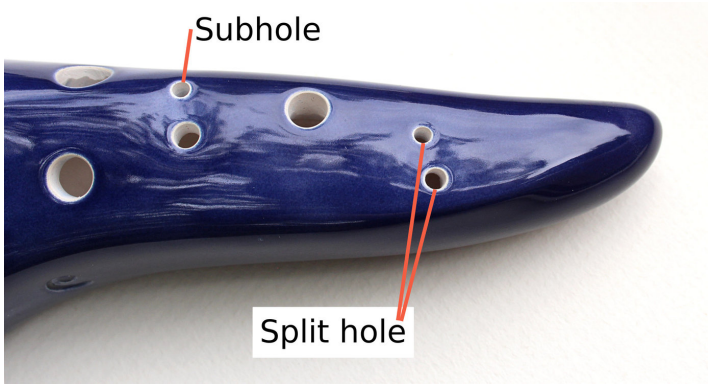
The 'cappello', Italian for 'hat', is a support point on the left hand end of the chamber. The left index finger may be placed on it while playing the high notes. How it is used is addressed in the section 'How to play the high notes of single chambered ocarinas(69)'.

Ocarina naming conventions

Ocarinas are usually classified both by the number of finger holes and by the number of chambers. The common basis of the single chamber is Guiseppe Donatis 10 hole design(10) consisting of 8 finger holes and 2 thumb holes, typically called a 10 hole ocarina.



Single chamber ocarinas often have more than these 10 basic holes through the addition of subholes and split holes. A subhole is an additional hole added to an ocarina which extends the playing range downwards, and otherwise an ocarina with subholes plays the same as one without. Ocarinas can have one or two subholes added, and such an instrument is called an 11 hole or 12 hole ocarina. An example of a subhole is shown in the following picture. Note that more holes isn't necessarily better, as covered at the end of the section.



Split holes look similar to a subhole but serve a different function. They do not increase the sounding range, but are a single hole split into two to make an accidental (sharp or flat(170)) easier to play. Ocarinas are fully chromatic and these notes are generally played by 'cross fingering(35)', covering the existing holes in a different order. On the high notes, this produces a well tuned accidental as there are many possible combinations. The number of options available decreases towards lower notes, and the available holes don't always allow a well tuned accidental. A split hole addresses this by giving the accidental a dedicated hole.

Note that the presence of a split hole does not change how an ocarina is named: while an 11 hole ocarina with a split hole technically has '12 holes' in the sense of having 12 holes to be covered by the fingers, it is still an 11 hole ocarina in naming and practice. You can think of a split hole as two .5 holes, together counting as a single hole. This is done because strictly using hole count as a classifier would be ambiguous, as the holes can serve differing functions.

There are other problems with classifying ocarinas using hole count. Ocarinas offer an unusual degree of flexibility in how they are tuned. It is trivial to tune holes in other ways, which can be done to make playing music from a given tradition easier, such as the Lydian soprano G I make for Highland pipe music. Non-Western scales are also possible, and naming using hole counts reveals nothing about these differences. In such cases, it is important to look for additional descriptions or a fingering chart.

Multichambers

As noted in the introduction, multichamber ocarinas are an extension of the single chamber to produce a larger range. Multichambers can be classified using hole count, but doing so can be confusing. While the design is relatively standardised, multichambers from different makers often have variations. Higher chambers may have subholes, and there are two different tuning systems in use, Asian and Pacchioni. Due to these differences, naming using hole count would be ambiguous.

Instead, they are classified relative to the number of chambers. Doubles have 2 chambers. Triples and quads have 3 and 4 chambers respectively. Exactly how the chambers are fingered can vary in subtle ways, and knowing the fingerings for any single ocarina requires reference to a fingering chart. See 'Multichamber ocarinas and their tuning systems(48)' and 'The fingering systems of multichamber ocarinas(54)'.

Variations in playing characteristics

Even within one of these groupings, ocarinas can vary a great deal. Varying factors like chamber volume, voicing size, and tuning, plus other factors like the size and smoothness of the windway, results in differing playing characteristics and timbre (tone colour). For example, traditional Italian ocarina designs trade off some range to attain maximum volume, using a very large voicing, an open windway, and high pressure. The 12 hole design on the other hand uses a (typically) lower pressure, smaller voicing, and smaller chamber volume, reducing airstream turbulence and allowing a larger range to be attained.

Many variations in volume, and timbre are possible, varying from a very pure sound, a 'reedy' sound, or a loose, airy sound. But of these, only designs leaning strongly towards a pure sound can provide the full range of a 12 hole. Thus, more holes isn't universally 'better'. Pursuing more holes locks a maker into a small corner of what the instrument's physics is technically able to do. Such designs even then still tend to suffer from airy or strained high notes. My preference leans towards 10 and 11 hole single chambers and multis. Multichambers can easily surpass the range of a 12 hole with none of the compromises.

Identifying playable ocarinas

In common language, the term 'ocarina' is often used as a catch-all term for vessel flutes, instruments based on a hollow chamber. This situation can be really confusing, as the term can refer to anything from serious musical instruments to untuned whistles with no finger holes. While classifiers do exist for these different types, many mainstream outlets don't know what they are selling, and you will see all of these listed blindly under the term 'ocarina'. This section gives an overview of what you are going to encounter, and features to look out for to help you identify playable ocarinas from this soup.

Be aware that ocarinas are normally made from clay, and all of the types listed here can be found in sculptural forms, including serious instruments. While ocarinas can function in many shapes, this is usually at the expense of playability. How playable an instrument is depends on how it relates to the human body and hands, called ergonomics. Sculptural ocarinas can be designed with ergonomics in mind, but they often do the opposite, forcing the hand to fit around the design. This is difficult to recognise without experience, and I do not recommend them as a first ocarina for this reason.

Clay whistles

As the name implies, they are whistles made from clay. Generally, they are sculptural and only sound a small range of pitch by varying blowing pressure, though they are also found with one or two untuned finger holes. These should be considered art pieces or novelty items as they are not tuned. Avoid them if you are looking for a playable instrument.

Peruvian 'ocarinas'

These are easily identified by their oval shape, and are normally made from red clay with artistic designs on the top. They are modern reproductions of historic South American instruments made as tourist items. As such, they are poorly made and normally no effort has been made to tune them. You can easily identify untuned ocarinas as all of the finger holes will be the same size. If you want a serious instrument, these should be avoided universally. They only have value as art pieces.

I have quoted the word 'ocarinas' in the heading, as it is doubtful they were actually called this historically. The word 'ocarina' comes from a dialect of Italian and is known to have existed in the 19th century, although its exact origin is unknown. As far as I know, the South American vessel flutes are considerably older than this, and thus it is questionable that the word existed at the time. I think it would be more appropriate to use a native Peruvian name for them, even if it was anglicised.

English pendant ocarinas (4/5/6 hole ocarinas)

These go under several names including 'English pendant ocarina', 'pendant ocarina', and '4/5/6 hole ocarina'. Pendants have 4 to 6 holes and are able to sound about an octave and a 3rd using binary-like fingering system. They are easily recognised, having 4 finger holes on the top with 0—2 thumb holes. Pendant ocarinas are usually round, although they are also made in various sculptural forms, including birds and other animals.

In my opinion, they are marginal as musical instruments. Production quality and tuning accuracy varies between makers, and they are frequently made as novelty items. Even in a well made example, this tuning system is a compromise; if you measure the tuning of the notes(40), you'll find tuning can vary by as much as half a semitone flat or sharp. While this can be compensated for with breath pressure, it places additional work on the player. These irregular changes in blowing pressure also make the timbre and volume of adjacent notes sound unbalanced.

The 4 hole system also offers little flexibility with ornamentation, as there are so few holes. Performing a pitch side normally requires sliding two or more fingers at once and, in many cases, ornaments like trills or mordants are practically impossible due to the tight multi-finger control it would entail. Some chromatic notes can only be performed by half-covering holes, and the rounded shape of these leaves a lot to be desired from an ergonomic perspective since fingers can easily slide off the instrument.

Because of these issues, I don't think they are worth the effort, besides possibly as a challenge for an experienced musician. Transverse ocarinas exist and have none of these problems. Because their pitch is so unstable, ocarinas are already challenging to play in tune, so dealing with the tuning irregularities and ornamental limitations of the 4 hole system on top of this is just making unneeded work for yourself.

Transverse ocarinas

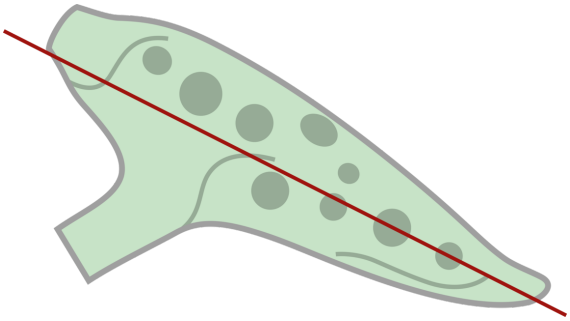
As the name implies, transverse ocarinas are held across the body similar to a flute. Yet they are both shorter and wider, being shaped like a cone with a protruding mouthpiece. They usually have at least 8 finger holes on top with 2 thumb holes and use a linear fingering system(35) similar to the flute or tin whistle. Transverse ocarinas are fully chromatic, achieving chromatic notes by covering the existing holes in a different order, a technique called cross fingering.

Transverse ocarinas are on the whole designed as serious instruments, but their quality varies a great deal. Before getting into specifics, there are a number of plastic examples on the market which should be avoided outright. These are easily identified as they have a notable ridge around the centre of the chamber. Most of the notes are over a semitone out of tune and the voicing is really poor, resulting in a unpleasant harsh and airy timbre.

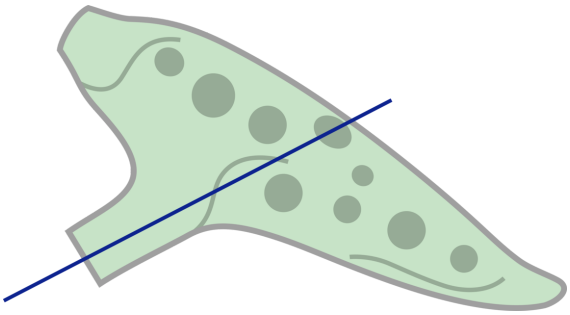
How the ocarina is balanced

An ocarina's balance plays a large part in whether or not it is comfortable to play. This is especially important with single chambers as they have two thumb holes. A poorly balanced instrument will be difficult to play and will feel a lot heavier than a well balanced one—at best, making your job harder and, at worst, causing hand or wrist pain.

Ocarinas have two planes of balance(81), primary and secondary. The primary plane runs between the right thumb hole and the right tail of the ocarina. It allows you to support the instrument using only the right thumb and pinky when held parallel to the ground.



The secondary plane runs between the left pinky hole and the mouthpiece. It is less important, being used in combination with the primary and rarely, if ever, by itself. Note that this plane can only be used when the pinky hole is placed on the side of the instrument.



Poorly balanced ocarinas will fail to balance on one or both of these planes. Of the two, the primary plane is absolutely essential, and an ocarina with no primary balance will be very difficult to play. In absence of it, many more fingers must be used to support the ocarina, preventing them from serving their normal function. There are two things to consider when evaluating an ocarina's primary balance plane: how the ocarina is balanced left to right, and how it balances front to back.

Left to right, an ocarina should balance between the right thumb and pinky, with a slight upward force on the pinky, when the instrument is parallel to the ground. If the ocarina falls away from the right pinky when you try to do this, you have a bad instrument. Conversely, if you feel an excessive amount of force pushing up on the right pinky, this is also poor balance and may lead to hand pain.

Front to back, the ocarina should either balance perfectly or have a slight tendency to roll toward the mouthpiece. Any ocarina which rolls forward is a bad instrument and will be exceptionally difficult to play. Working around this demands that more fingers support the instrument, as noted previously.

On visually centred designs, it is not uncommon to see small or large protrusions added to ocarinas for aesthetic preposes. Unless their mass is counterbalanced by adding the same amount of mass to the opposite side of the balance plane, this will upset the instrument's balance. Such features will also get in the way of the hands, forcing them into a given posture which may or may not be uncomfortable for you. Consequently, you should avoid such designs if looking for a serious instrument.

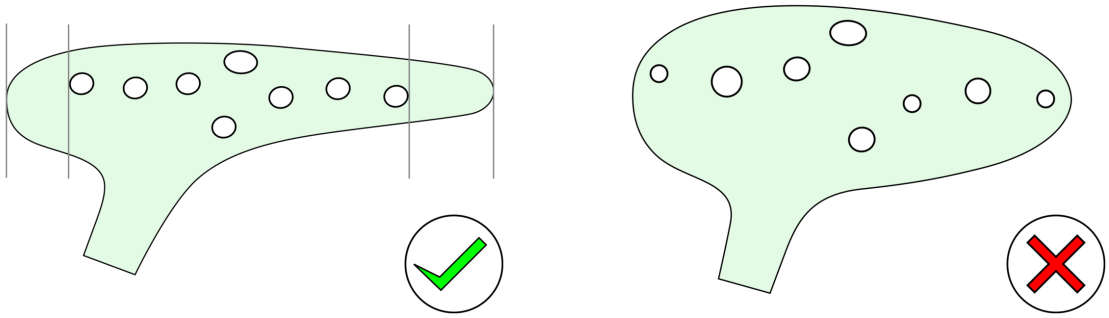
Chamber shape

The physical shape of an ocarina must serve two functions: it must work acoustically and it must be ergonomic. While ocarinas will make a sound in many shapes, the ergonomic demands make the majority of these unplayable, or at least not optimal.

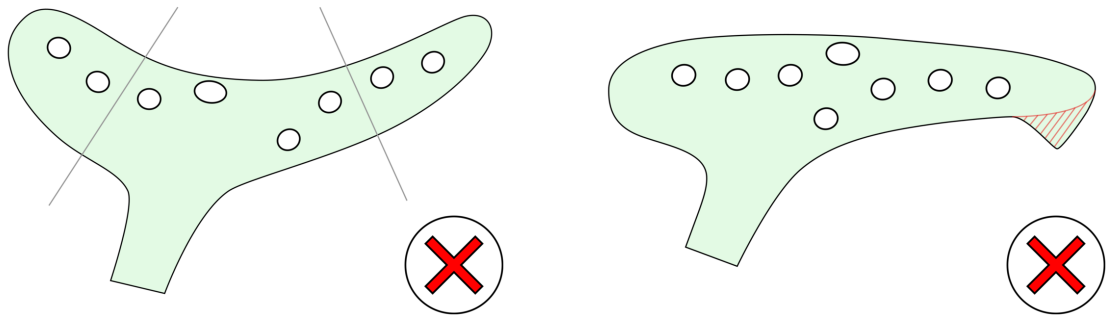
The ergonomics of single chambered ocarinas are quite complicated because they have two thumb holes; the right thumb both supports the instrument and plays a note. In order to deal with this, the primary balance plane mentioned before is critical. Because of this, ocarinas must have space to rest the right pinky finger next to its hole. If the palm grip is going to be used, this section needs to be considerably longer so that the player isn't inadvertently shading finger holes. Consequently, any ocarina that butts the right pinky hole right up against the end of the chamber is a bad instrument.

It is also possible to use the left index finger to support the ocarina on the high notes, so having a similar space beside the left index hole is also very useful.

The two diagrams below contrast a good and bad design. In the good design, a notable space is left besides the right and left pinky holes, shown by the vertical lines. The right hand section of the chamber is pretty straight to prevent the pinky finger sliding off the end of the chamber. Contrast this with the bad design; the chamber is very rounded with the holes butted right up against the end of the chamber. There is nowhere to rest the pinky to support the instrument, and utilising the palm grip is almost impossible because the rounded shape offers nowhere to grip. Consequently, such designs feel unstable in the hand.



As was implied in previous sections, features added for visual effect often work against playability. For example, placing a protrusion on the inside of the tail may look good, but it will dig into your hand if you use the palm grip. Curved chambers can also look good but cause numerous problems; if the chamber curls away from the mouthpiece as shown, the instrument will tend to be front-heavy. The ergonomics are also poor as the left hand must turn inwards more than normal to counteract the curve. The overlaid lines show the average angles of the two hands. The opposite of this design, with the chamber curling toward the player, is even worse as the centre of balance is a long way back. The right hand is scrunched very close to the face and the tail slopes inwards, encouraging the pinky to slide off the end of the chamber.



Sound

Ocarinas should have a pure sound underlain by a small amount of airiness, and this sound should be fairly consistent over the whole range. Airiness will increase towards the high notes, as they must be blown harder, but this should never drown out the ocarina's primary tone. An ocarina which sounds especially harsh or airy indicates either that it is being blown too hard or its voicing and windway are terrible.

If an ocarina sounds fine on its low notes, but its high notes are exceptionally airy, this can also signify a bad instrument. But do note that ocarinas are very sensitive to playing technique(96), particularly on the high notes, so this can also indicate poor player technique. If an ocarina is sold as 'needing an acute bend', it is probably a bad instrument. 10 and 11 hole ocarinas typically don't have this problem, and multichambers are vastly superior to 12 hole ocarinas if you want more range.

Hole placement and size

Hole placement is a somewhat difficult topic to discuss, as everyone's hands are different(69). Thus, what works for one player may not for another. The main point to note is that an ocarina's hole placement should never force your wrist to fold hard forward or backward. The fingers are controlled by muscles in the forearm through a number of long tendons. These run through a small channel in the wrist, and folding the wrist hard in either direction compresses it. Consequently, playing with the wrist in this position for a long time is liable to cause repetitive strain issues and/or wrist pain.

For my own hands, keeping the wrist straight entails having my fingertips directly above my thumb, evident from the pictures. But as everyone's hands are different, this may or may not work for you. You can get an idea of the relative lengths of your fingers if you hold your hand like in the pictures, with the wrist straight and your thumb as horizontal as possible. Keep a slight curl along your fingers and note where the fingertips are relative to your thumb. Notice that the angle of your palm relative to the thumb and the angle of your forearm also matter.

While ocarina makers rarely document the hole alignment of their instrument, you can learn to recognise it from photographs. For example, a design which places the right hand finger holes very close to the edge of the chamber would work if you happen to have a long thumb relative to your fingers, but would force the wrist to fold if you don't. A reasonable starting point is to look for an ocarina where the finger holes are placed directly opposite the thumb holes, and you can normally adapt from this by allowing your fingers to overhang the holes. 10 hole ocarinas are in theory better able to adapt to differences in players' hands, as there is no need to hold fingers back to avoid covering subholes unintentionally.

The placement of the right thumb hole is important as it determines if the instrument will balance on the primary balance plane. Thus, the location of this hole is forced by the ocarina's weight distribution. Ideally, an ocarina will be designed to balance such that the thumb hole aligns well with the finger holes, but this isn't always the case. I suspect that it is fairly

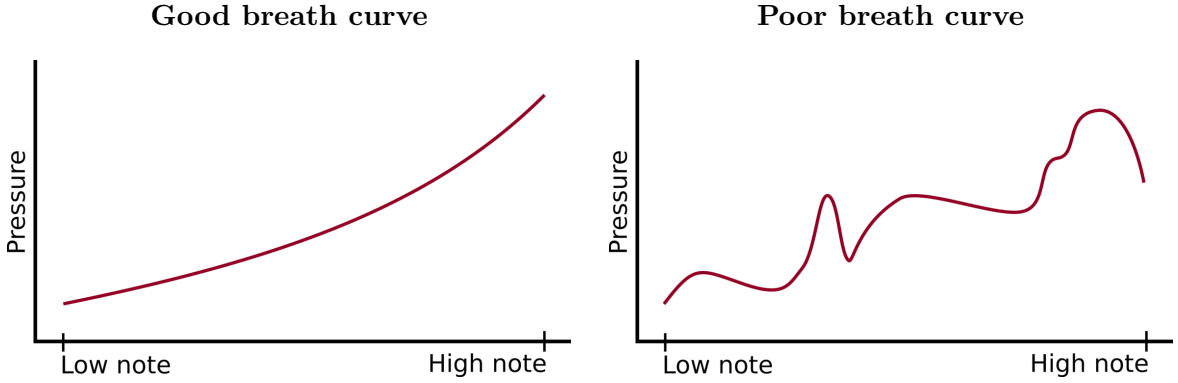
common to design the instrument first, then put the right thumb hole wherever the design happens to balance. An ocarina designed in this way may have a forced misalignment between the finger and thumb holes and that may be a problem depending on your hand proportions.

Hole placement is frequently one of the biggest compromises made in sculptural ocarinas, as the design is often made first and the holes placed to fit around it, not the player's hands. This often forces the hands to make awkward compensations like folding the wrists back and may cause hand pain as a result.

Breath curves and tuning

As holes are opened, air can escape and an ocarina will become increasingly airy sounding. To compensate for this, the player has to blow harder. How the pressure changes from note to note is called an ocarina's breath curve(40). Breath curves vary a great deal between ocarinas: they can be relatively flat, or ramp up exponentially towards the high end. You can get a reasonable idea of the pressure required to play an ocarina by looking at the sizes of the finger holes. Larger holes generally indicate an ocarina tuned a higher pressure, but this isn't foolproof as hole size also depends on chamber shape and wall thickness.

The breath curve should be relatively consistent over the entirety of an ocarina's range, with no large arbitrary changes. You can verify this by checking the tuning of sequential notes(40). If you finger a note, then lift the finger for the note above without changing your breath pressure, this note will fall flat. You can measure these changes using a chromatic tuner; they may gradually increase or decrease between sequential notes but this variance should be regular. Large irregular changes between close notes generally indicate a poorly made ocarina.



Surface finish

Because general playing technique requires sliding fingers over the surface of the instrument, surface finish has a big impact on playability(61). Ocarinas are commonly available with 4 different finishes: fired glazes, natural shellac, synthetic finishes, or the plain finish of the ceramic itself.

Excessively smooth and shiny finishes can pose problems. If you have any moisture on your fingers, the skin will tend to cling. This is not a problem with plain finish ocarinas as the earthenware absorbs finger moisture. It is also far less of a problem with rougher 'matte' glazes and shellac. In any case, applying a small amount of talk or chalk dust to the fingers greatly reduces this problem. It prevents the gripping surface of the skin touching the instrument.

Finishes which are excessively textured, often for sculptural effect, can also be a problem. Unlike texture on a microscopic scale, this will frequently physically block the fingers from sliding over the surface, unless an ocarina is designed such that the areas around its finger holes are left smooth.

Inline ocarinas

Inline ocarinas are very similar to transverse ocarinas, but the windway and chamber are inline with each other, resembling a tubular instrument but shorter and wider. They are usually rectangular in shape and use a fingering system that is identical or very close to a transverse. Thus, you will find roughly 8 holes on top, with 2 thumb holes. Inlines are generally designed as serious instruments, and I don't have much to say that hasn't already been said in the previous section.

It is worth noting that the ergonomics of inline ocarinas differ from transverse ocarinas. They retain two thumb holes, but due to their design typically lack the balance planes found in a transverse. In the rectangular designs, supporting the instrument on the high notes is instead achieved by pressing the pinky finger against the end of the instrument, balancing it between the pinky and the lips. This works in higher pitched instruments but doesn't scale that well, as increasing the chamber volume both increases the weight of the instrument and moves it farther from the body, increasing leverage. Transverse ocarinas don't have this issue, as the design keeps the weight closer to the body. The instrument is normally balanced perfectly on the primary plane.

I'd question the playability of ocarinas which are both perfectly inline and rounded in shape. Due to the absence of the balance planes, there is usually no good way of supporting such an ocarina on its high notes. The trick with the pinky is generally not effective if the chamber is rounded, as there is nothing to grip.

Multichambered ocarinas

Most multichambered ocarinas(48) are a direct extension of the single chambered transverse design. Their fingering system is almost identical, but additional chambers are added to extend the range. Note that there are multis which instead focus on harmony. These are covered in the next section.

Once you get into multichambers, the percentage of novelty items or poor quality instruments reduces a lot, so you have a lot less to worry about. The points made regarding single chambers mostly apply to multis as well, though there are three things you should look out for: physical balance, the design of the mouthpiece, and pressure balance between chambers.

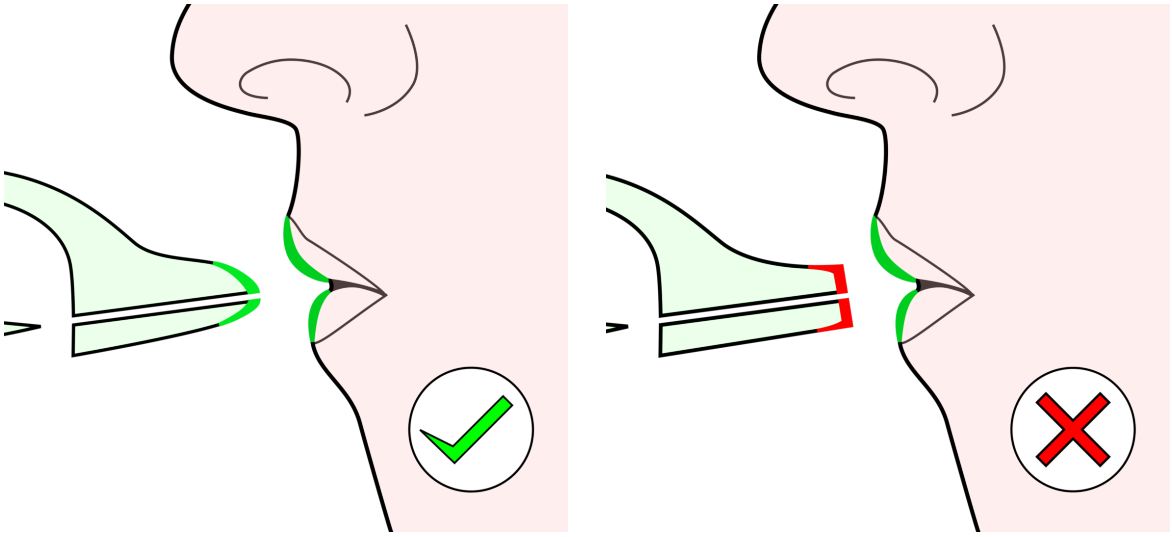
Physical balance

Like a single chamber, how a multichamber balances has a big impact on its playability. It is very useful to retain the ability to balance the instrument between the right thumb and pinky. As most multichambers lack a right thumb hole, this makes the instrument effortless to support. Triples and quads will often balance like this, as the third chamber counterbalances

the first. Achieving this balance in a double is more tricky, and generally requires using the mouthpiece to counterbalance the first chamber. The mouthpiece must be angled to do this effectively, so I'd question the balance of double ocarinas lacking an angled mouthpiece.

The shape of the mouthpiece

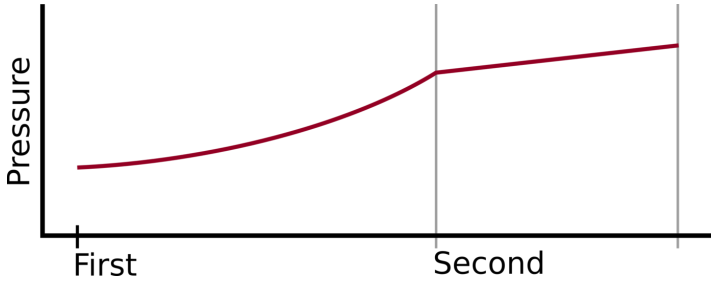
Each chamber of a multichambered ocarina has its own windway and typically only one is blown at a time. The air is directed into the desired windway by forming an aperture between your lips. As the interior of the lips is rounded, it is easiest to do so when the mouthpiece is also rounded in a complementary way. However, it is not uncommon to see multichambers with the mouthpiece coming to a sharp rectangular edge. This isn't very ergonomic, and will dig into your lips.



Pressure balance between chambers

Like the pressure curve of a single chambered ocarina should be regular over its sounding range, the same should be true of a multichamber. When you play through the instrument linearly, the pressure should increase regularly across the first chamber, and this should continue onto the second. There should be no irregular increase or decrease between two chambers.

Because an ocarina's breath curve is approximately exponential, maintaining a completely regular pressure change over the entirety of a multichamber is impossible, as the high notes would be tuned to an insanely high pressure and would squeak. Instead, the second and higher chambers are usually tuned with a flatter increase. This is possible as smaller chambers are easier to drive, and the higher chambers produce less range than the first.



Harmony ocarinas

The majority of multichambered ocarinas are designed to produce a larger sounding range, not play in harmony. Some transverse doubles and triples can sound in harmony close to their chamber break, although this is not their main focus. Other multichambered ocarinas are designed explicitly to play in harmony. They can sound wonderful, but are very limited due to technical constraints.

The problem with harmony ocarinas is that pitch changes with blowing pressure, and a given fingering only sounds good within a limited pressure range. If you have two chambers blown by a single player, this is a problem. The only way to have both chambers receive the optimal amount of pressure is to always have them play at a fixed interval, such as a 3rd or 5th. If different notes are fingered, different pressures are required and the instrument goes out of tune with itself.

This pressure difference can be addressed to some extent by using a very wide sound hole with the labium very close to the exit of the windway. But while this helps, it doesn't fully solve the problem. Ocarinas are lossy instruments; as holes are opened, more air is needed to drive the chamber. Such a voicing design will sound at the same pressure over a larger range, but total range is reduced. This voicing design also creates a relatively 'buzzy' timbre which many players don't seem to like.

I don't think that these are 'bad', and very impressive performances have been recorded using harmony ocarinas, such as those by Nancy Rumble. That being said, this idea is fundamentally limited, and ensemble playing may offer more scope for playing ocarinas in harmony.